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(54) Abstract Title
Drill jig and method of treatment of timber

(57) The jig has a body (2) having a base surface (4) by which it can rest against timber (6) to be treated and a spigot (12) projecting from the body, the spigot axis being substantially perpendicular to the base surface. Formed through the body is at least one guide bore (28,29) for guiding eg a drill bit during formation of a bore in the timber. The guide bore is separated from the spigot but inclined toward it, so that the guide bore axis intersects the spigot axis within the timber. In use, a first generally perpendicular bore (25) is formed freehand in the timber, then the jig is located on the timber with its spigot in the first timber bore and further bores (30, 32 Fig 2), intersecting the first, are formed through the guide bore(s). To allow treatment of wood of more than one thickness, the jig preferably has two guide bores with differing angles of inclination. Correspondingly, the spigot may be receivable at two different locations on the body.

FIG. 1.

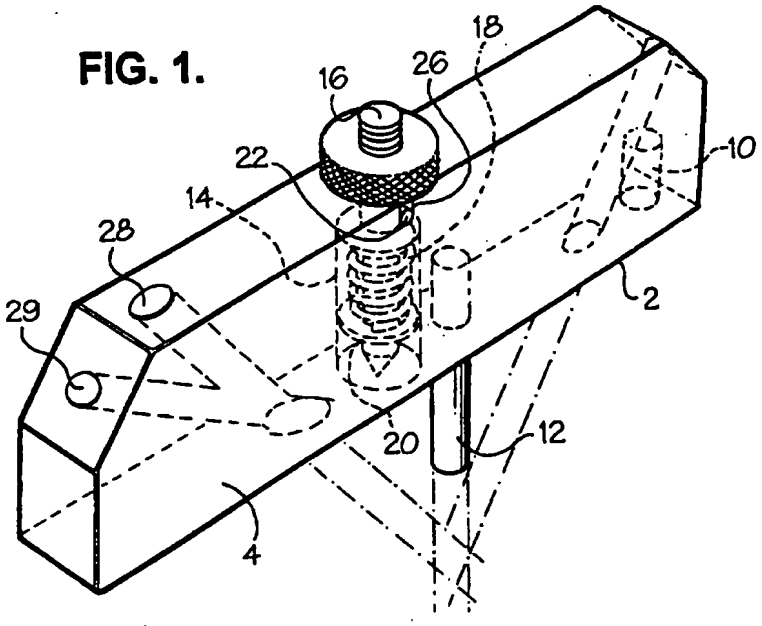

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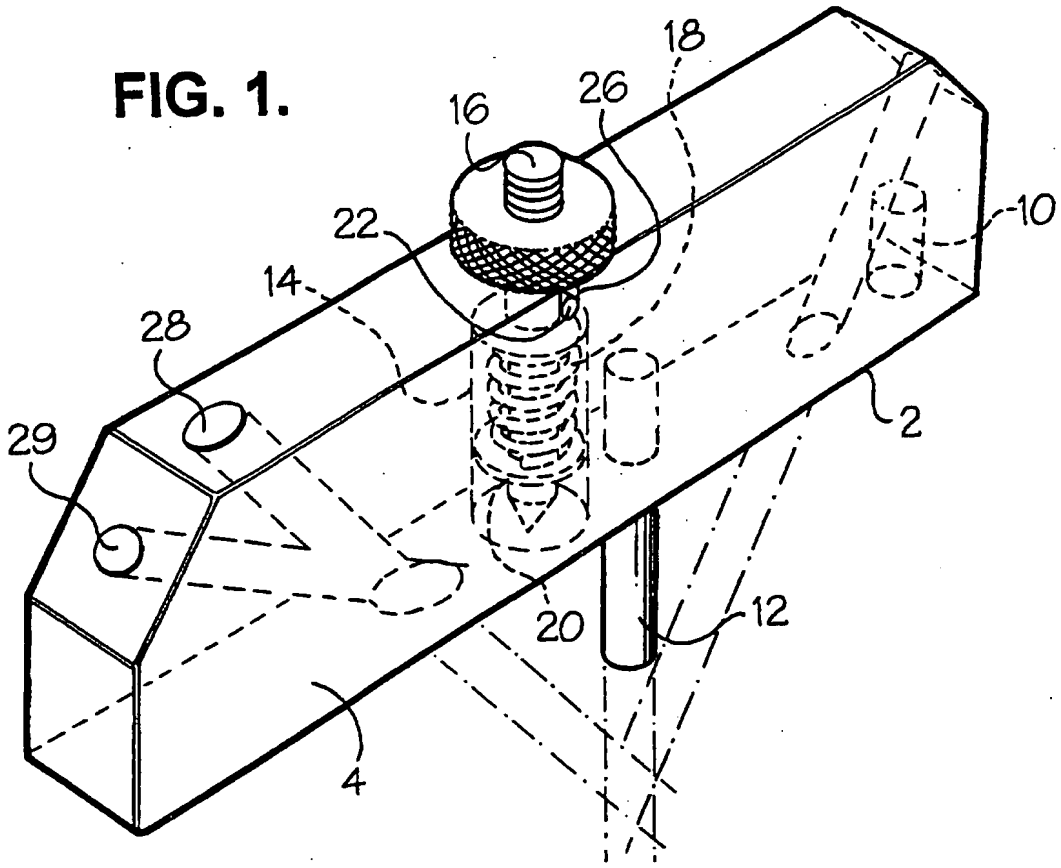
FIG. 1.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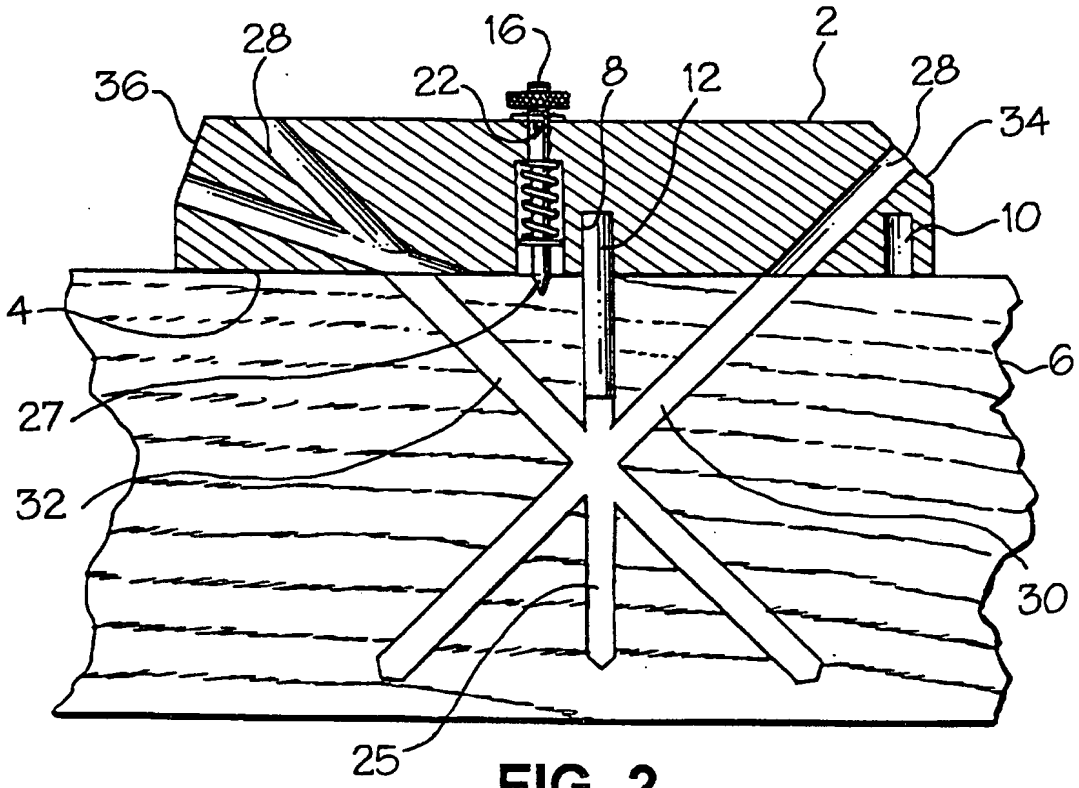
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FIG. 2.

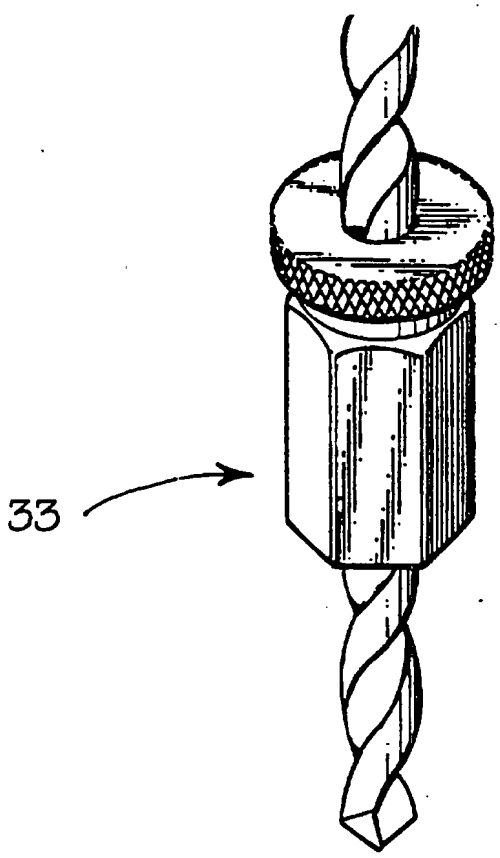


FIG. 3

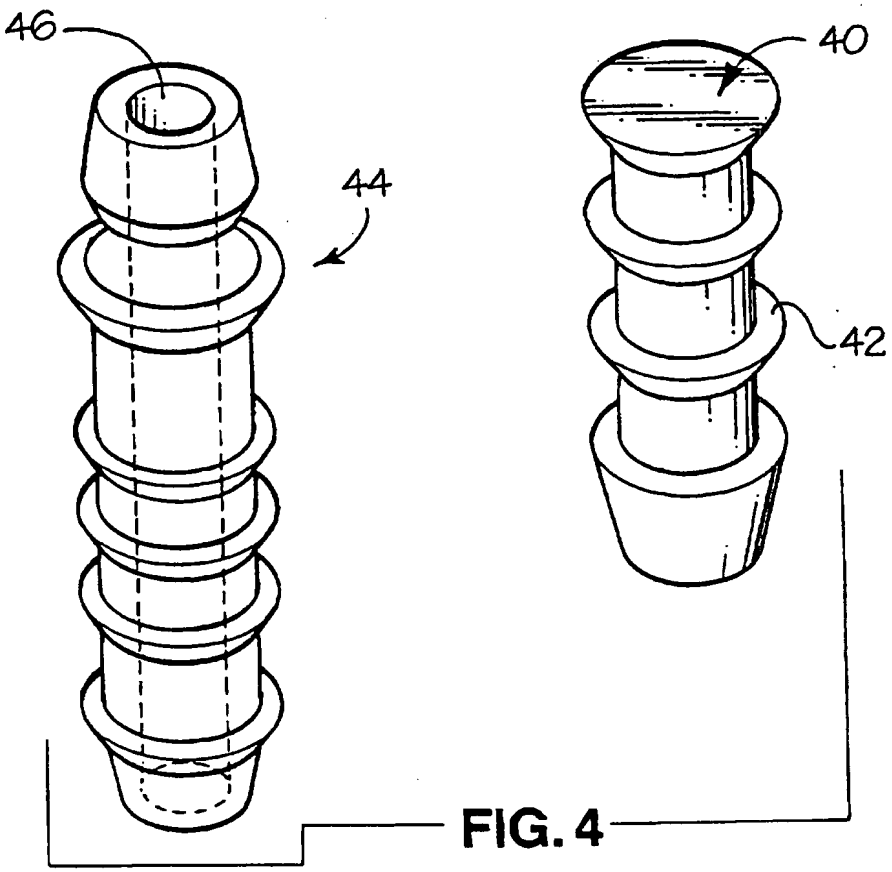
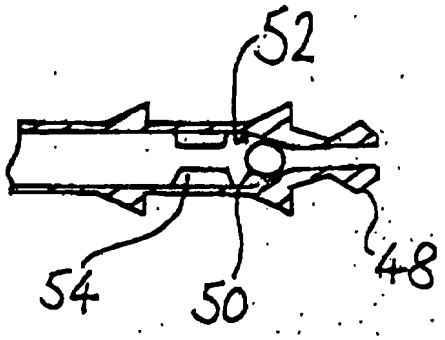


FIG. 4

FIG.5



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DESCRIPTION

DRILL JIG AND METHOD OF TREATMENT OF TIMBER

The present invention relates to a drill jig for use in treatment of timber, the jig being adapted to assist in forming a set of interconnected bores in the timber suitable for receipt of preservative. The invention also concerns a method of treatment of timber using such a jig.

It is known to treat timber against degradation such as rotting by impregnation with a preservative fluid. The inventor's United Kingdom patent no. 2176137 describes a drill jig for use in such impregnation of timber. The jig assists in drilling of a set of interconnecting bores, most of which are closed by means of plugs prior to injection into one of the bores of a preservative liquid, which can then be retained in the wood by plugging the final bore. The jig itself comprises a body having a base surface for placement against the timber to be treated and a circular locating spigot projecting from the base surface, a first guide bore being formed coaxially with and through the spigot, and through the body. A second guide bore is also formed through the spigot and the body, intersecting with the first within the spigot. Yet a third guide bore is formed in the body, being parallel to the first but laterally separated therefrom. The three bores lie in a common plane. The diameter of the spigot is

necessarily larger than that of the guide bores.

In use of the jig, a line of equally spaced shallow pilot holes is first formed freehand in the timber to be treated. The jig is then located at a first position on the timber with its base surface against the timber and its spigot received in a first pilot hole, and (using a drill of smaller diameter than the drill used to form the pilot holes) three bores are formed in the timber through the respective guide holes.. The depth and relative inclination of the bores is such that those formed through the second and third guide bores intersect in the timber, the three bores thus being interconnected. Depth control is provided by a collet secured to the drill bit itself. The jig is then rotated through 180 degrees (while the spigot remains located in the pilot hole) and a further intersecting pair of bores is formed through the second and third guide bores. The jig is then moved on to the next pilot hole, and the process is repeated. If desired, the spacing of the pilot holes can be such that the bores in the timber form a continuous channel, the inclined bore of one set intersecting with a vertical bore of the neighbouring set.

While this known jig has proven to be highly effective, particularly in applications where high quality is important, the time taken for its use is disadvantageous in certain contexts. There is thus a need for a jig which is

quicker to use, eg in rapidly treating external timber on buildings such as window sills, door frames and jambs.

A further difficulty with the existing jig is that motion thereof between drilling operations could cause misalignment.

Still a further difficulty arises in the context of sills and jambs since the latter are typically of considerably greater depth than the former. A different arrangement of the bores is thus desirable for these two types of component, but using the existing design this could be provided only by use of two separate jigs, adding undesirably to the cost and bulk of the required toolkit.

The present invention is intended to overcome, or at least to alleviate, one or more of the above mentioned problems.

In accordance with a first aspect of the present invention, there is a drill jig for use in timber treatment, comprising a body having a base surface for placement against timber to be treated, a spigot projecting from the body, the axis of the spigot being at least substantially perpendicular to the base surface, and a guide bore extending through the guide body, the guide bore being spaced apart from the spigot and being inclined toward the axis of the spigot, such that following boring in the timber to be treated of a first bore at least substantially perpendicular to the timber surface the jig can be disposed

with its base surface against the timber and its spigot in the first bore serving to locate the jig, and a second bore can then be formed through the guide bore into the timber, the second bore intersecting the first bore within the timber.

Thus at least a pair of communicating bores can be formed in the timber through only two drilling operations and without changing the boring tool (typically a drill bit). In practice, use of the jig according to the present invention is consequently found to be considerably more rapid than use of the above described prior art jig.

It is preferable to form a third bore in the timber, communicating with the first two. This may be achieved by rotating the jig about the spigot and then forming the required third bore through the guide bore. The angle through which the jig is rotated may be 180 degrees - so that the three resultant bores lie in a common plane. Alternatively, some other angle may be selected and indeed several bores may be formed in this way - eg a set of four bores each at right angles to its neighbours.

However, it is preferred also to provide a second guide bore extending through the body, the second guide bore being on the opposite side of the spigot from the first guide bore and being separated from the spigot but inclined toward the axis of the spigot, such that following formation of the

second bore in the timber, and while the body remains in position, a third bore in the timber can be formed through the second guide bore, the third bore intersecting the first bore within the timber.

Hence two inclined bores can be formed without the need to move the drill jig.

Where timbers of differing thicknesses are to be treated, it is necessary to provide for formation of bores with differing angles of inclination to the timber surface. In accordance with a particularly preferred aspect of the present invention, the drill jig comprises a further guide bore which is separated from the spigot but inclined toward the axis of the spigot such that the axes of the spigot and the guide bore intersect at a point outside the body, the angle of inclination of the further guide bore to the axis of the spigot being substantially larger than the angle of inclination of the first mentioned guide bore to the axis of the spigot.

In such an arrangement, it is particularly preferred that the spigot is receivable in either of two locations on the body.

In a further preferred aspect of the present invention, a pin, spike or other means for engagement with the timber is provided and is retractably mounted with respect to the body such as to be protrudable from the base

surface to engage with the timber in use and thereby locate the body in use against rotation about the spigot.

In accordance with a second aspect of the present invention, there is a method of treatment of timber, comprising boring freehand a first bore in the timber substantially perpendicular to its surface, providing a drill jig having a base surface for placement against the timber, a spigot projecting from the body, the axis of the spigot being at least substantially perpendicular to the base surface, and a guide bore extending through the body, the guide bore being spaced apart form the spigot and being inclined toward the axis of the spigot, positioning the body with its base surface against the timber surface and its spigot in the first bore serving to locate the jig, forming a second bore through the guide bore into the timber, the second bore intersecting the first bore within the timber, closing one of the bores at or adjacent the timber surface, introducing preservative through the other of the bores and closing the remaining bore at or adjacent the timber surface.

A specific embodiment of the present invention will now be described, by way of example only, with reference to the accompanying drawings, in which :-

Fig. 1 is a perspective illustration of a drill jig embodying the present

invention;

Fig. 2 is a longitudinal section through the drill jig when mounted on timber to be treated;

Fig.3 is a perspective illustration of a collet used as a depth stop mounted on a drill bit;

Fig.4 illustrates a pair of plugs for use with the present invention; and

Fig. 5 is a longitudinal section through part of one of the plugs illustrated in Fig. 4.

The body 2 of the drill jig is in this exemplary embodiment formed of a single piece of rectangular section mild steel having a planar base surface 4 (the lowermost surface of the body) for placement against the timber 6. Formed in the base surface 4, and perpendicular thereto, are a middle spigot receiving bore 8 and an end spigot receiving bore 10, the former being at or near the middle of the body, the latter being adjacent its end. A single spigot 12 is provided, consisting of a cylindrical metal pin which is a push fit in both of the spigot receiving bores and so can be removably mounted in either. Of course, a more secure fitting of the spigot to the body could be provided, eg by means of a screw thread.

A through going bore 14 is formed in the body perpendicularly to the base surface, adjacent the middle spigot receiving bore 8, and slidably receives a pin 16. The lower part of the bore 14 is of enlarged diameter and receives a helical spring 18 which surrounds the pin and, being constrained between a shoulder in the bore and a small radial restraining rod 20 extending through the pin 16, biases the pin downwardly - ie toward a position in which it projects from the base surface of the body. Downward motion of the pin is restrained by a further small restraining rod 22 extending radially through an upper part of the pin 16. The rod 22 may rest on the uppermost surface of the body as illustrated, thereby retaining the pin in a withdrawn position. However, by rotating the pin using a knurled wheel 24 the user can cause the rod 22 to align with and descend into a slot 26 formed in the upper surface of the body, allowing the pin 16 to project from the base surface. The pin 16 has a sharpened lower end 27 to dig into the timber surface.

Three through going guide bores are formed in the body, each lying in the same plane, which also contains the two spigot receiving bores. The first and second guide bores 28 are symmetrically disposed about the middle spigot receiving bore, each being separated from the middle spigot receiving bore and inclined toward it at an included angle of 45 degrees, so that the axes of these

three bores meet (or approximately meet, bearing in mind manufacturing tolerances) at a point below the base surface. The third guide bore (29) is formed into an end surface of the body remote from the end spigot receiving bore 10, and is inclined toward the spigot receiving bores at an included angle of 70 degrees - ie a larger angle than the other two guide bores.

The illustrated jig can be used in two different ways in order to treat wood of different depths. When treating a window frame, for example, the jig is used in different ways to treat the shallow wood of the frame and the deeper wood of the sill.

To treat the sill, the user first drills - typically using an ordinary twist bit in a hand held electric drill used freehand - a bore 25 which is perpendicular (or at least roughly so) to the outer vertical surface of the sill. The spigot of the jig is mounted in the middle spigot receiving bore 8 and is then inserted in the perpendicular bore 25 (in which it should be a close fit, in order to prevent wobbling of the jig) and the tip 27 of the pin 16 is pushed into the timber surface, perhaps by hand or even through a tap with a hammer, to prevent rotation of the jig.

The same bit is then introduced into the first guide bore in the jig body, in which it is a loose sliding fit, and is guided thereby during formation of an

inclined bore in the timber seen at 30. A second inclined bore 32 intersecting both the perpendicular bore and the first inclined bore is then formed through the second guide bore in the jig body. In this way a network of bores is formed through which preservative can permeate the timber. Preferably the bores continue beyond their intersection, terminating roughly 1 centimetre from the far surface of the timber. Depth control can be effected using an optional collet 33 received on the drill bit and located thereon at a selected depth by a radial grub screw. Abutment of the collet against shoulders 34,36 of the jig body limits the depth of the bores.

The boring process is repeated at selected intervals along the length of the sill, although it is not necessary for the respective sets of bores to interconnect to form a continuous channel.

To treat the narrower timber of the window frame, the spigot is positioned in the end spigot receiving bore 10. As before, a perpendicular bore is formed freehand in the timber and receives the spigot of the jig, which may be located against rotation by use of the retractable pin if desired. The drill bit is then inserted in the third guide bore, which as previously mentioned has a steeper angle - 70 degrees - of inclination to the vertical axis defined by the spigot (or to put this another way, it forms a shallower angle to the surface of

the timber - 20 degrees), and an inclined bore is thereby formed in the timber which intersects the perpendicular freehand bore. To form the required further inclined bore, the jig is rotated about the spigot - preferably through 180 degrees - and the required bore in the timber is again formed through the third guide bore in the jig body. As before, the bores are preferably formed sufficiently deep to come within roughly a centimetre of the rear face of the timber.

By virtue of the shallow angle of the inclined bores thus formed to the timber surface, it is possible to treat narrow timber without excessively frequent repetition along the timber length.

Either of the above described modes of use of the drill jig results in a set of three interconnecting bores. The next step for the user is to plug two of the bores, introduce a preservative fluid through the remaining bore, and then plug the remaining bore to retain the fluid and ensure that it permeates the wood.

To facilitate this process, plastics plugs are provided, as illustrated in Fig. 4. A closed plug 40 bears on its outer surface circumferential barbing vanes 42 which help to retain the plug in a bore and to form a seal therewith. An open plug 44 may also be utilised in one of a set of bores to allow for the

fluid to be periodically replenished. The open plug has a cavity extending along its length and issuing in a small opening 46 at the outer end of the plug through which fluid can be injected.

At its outer end the open plug 44 has a shaped head 48 for receiving a fitting of a pressurised preservative delivery tube. In this manner, to aid its permeation through the timber, the preservative may be injected at pressures in the region of 150 psi (1000kPa).

To maintain this pressure for a period typically in the region of two hours, the open plug 44 contains a ball non-return valve comprising a movable plastics ball 50 which is forced by pressure from the inner end of the plug against a conical valve seat 52. The ball is retained within the plug by internal cores 54, past which it is resiliently forced during assembly.

Pressure cannot be maintained indefinitely in this manner, particularly due to escape of gas and fluid into the surrounding timber. When the pressure within the network of bores falls, the non-return valve can open. To prevent consequent escape of preservative, a closed plug 40 is, after injection of the preservative, forced into position over the open plug 44. A recess in the lower part of the closed plug 40 (not seen in the drawings) receives the head 48 of the open plug.

Where necessary, the outer ends of the bores can also be filled and thereby sealed and concealed.

CLAIMS

1. A drill jig for use in timber treatment, comprising a body having a base surface for placement against timber to be treated, a spigot projecting from the body, the axis of the spigot being at least substantially perpendicular to the base surface, and a guide bore extending through the guide body, the guide bore being spaced apart from the spigot and being inclined toward the axis of the spigot, such that following boring in the timber to be treated of a first bore at least substantially perpendicular to the timber surface the jig can be disposed with its base surface against the timber and its spigot in the first bore serving to locate the jig, and a second bore can then be formed through the guide bore into the timber, the second bore intersecting the first bore within the timber.

2. A drill jig as claimed in claim 1 comprising a second guide bore extending through the body, the second guide bore being on the opposite side of the spigot from the first guide bore and being separated from the spigot but inclined toward the axis of the spigot, such that following formation of the second bore in the timber, and while the body remains in position, a third bore in the timber can be formed through the second guide bore, the third bore

intersecting the first bore within the timber.

3. A drill jig as claimed in claim 2, wherein the axes of the spigot, the first mentioned guide bore and the second guide bore lie in a common plane.

4. A drill jig as claimed in claim 3, wherein the axes of the spigot, the first mentioned guide bore and the second guide bore intersect at a common point.

5. A drill jig as claimed in any preceding claim, comprising a further guide bore which is separated from the spigot but inclined toward the axis of the spigot such that the axes of the spigot and the guide bore intersect at a point outside the body, the angle of inclination of the further guide bore to the axis of the spigot being substantially larger than the angle of inclination of the first mentioned guide bore to the axis of the spigot.

6. A drill jig as claimed in any preceding claim, wherein the spigot is receivable in either of two locations on the body.

7. A drill jig as claimed in claim 1, wherein the spigot is receivable in either of two locations on the body, the first location being centrally disposed between the first mentioned guide bore and a second guide bore which extends through the body and is inclined toward the axis of the spigot, such that the axes of the spigot and of the first and second guide bores intersect a first

distance from the body, there being a third guide bore extending through the body whose angle of inclination to the spigot axis is substantially larger than the angle of inclination of the first two guide bores, the second location for the spigot being remote from the third guide bore and being such that the axis of the third guide bore intersects the axis of the spigot a second distance from the body, the second distance being substantially smaller than the first.

8. A drill jig as claimed in any preceding claim, further comprising a pin, spike or other means for engagement with the timber retractably mounted with respect to the body such as to be protrudable from the base surface to engage with the timber in use and thereby locate the body in use against rotation about the spigot.

9. A drill jig as claimed in claim 8, wherein the means for engagement with the timber is resiliently biased toward a position in which it projects from the body.

10. A drill jig as claimed in claim 9, wherein the means for engagement with the timber is lockable in a position in which it does not project from the body.

11. A drill jig as claimed in any preceding claim, wherein the internal diameter of the guide bores and the external diameter of the spigot are

substantially the same.

12. A kit of parts for treatment of timber, comprising a drill jig as claimed in any preceding claim and a set of plastics plugs insertable in the bores in the timber, each plug being barbed on its exterior such as to resist withdrawal from a bore.

13. A kit of parts as claimed in claim 12, wherein at least some of the plugs are open such that preservative can be injected therethrough and contain a non-return valve to prevent or at least inhibit flow outwardly of a bore when subject to excess pressure from within the bore.

14. A method of treatment of timber, comprising boring freehand a first bore in the timber substantially perpendicular to its surface, providing a drill jig having a base surface for placement against the timber, a spigot projecting from the body, the axis of the spigot being at least substantially perpendicular to the base surface, and a guide bore extending through the body, the guide bore being spaced apart form the spigot and being inclined toward the axis of the spigot, positioning the body with its base surface against the timber surface and its spigot in the first bore serving to locate the jig, forming a second bore through the guide bore into the timber, the second bore intersecting the first bore within the timber, closing one of the bores at or adjacent the timber

surface, introducing preservative through the other of the bores and closing the remaining bore at or adjacent the timber surface.

15. A method as claimed in claim 14, comprising the further step of forming, through a guide bore in the body, a third bore which intersects at least one of the other bores, the third bore being subsequently closed at or adjacent the timber surface.

16. A method as claimed in claim 14 or claim 15, comprising the further step of driving into the timber surface a pin, spike or other means for engagement with the timber which is retractably mounted with respect to the body and thereby locating the body against rotation about the spigot.

17. A method as claimed in any of claims 14 to 16, comprising the further steps of inserting into one of the bores a plug which is open such as to permit passage of preservative therethrough but which is closable by a non-return valve constructed to prevent or at least inhibit flow out of the bore when subject to excess pressure from within the bore, and then injecting preservative through the plug under pressure.

18. A drill jig substantially as herein described with reference to, and as illustrated in, the accompanying drawings.

19 A method of treatment of timber substantially as herein described with reference to, and as illustrated in, the accompanying drawings.

Amendments to the claims have been filed as follows

1. A drill jig for use in timber treatment, comprising a body having a base surface for placement against timber to be treated, a spigot projecting from the body, the axis of the spigot being at least substantially perpendicular to the base surface, and a guide bore extending through the guide body, the guide bore being spaced apart from the spigot and being inclined toward the axis of the spigot, such that following boring in the timber to be treated of a first bore at least substantially perpendicular to the timber surface the jig can be disposed with its base surface against the timber and its spigot in the first bore serving to locate the jig, and a second bore can then be formed through the guide bore into the timber, the second bore intersecting the first bore within the timber and the same boring tool being used to form the first and second bores.

2. A drill jig as claimed in claim 1 comprising a second guide bore extending through the body, the second guide bore being on the opposite side of the spigot from the first guide bore and being separated from the spigot but inclined toward the axis of the spigot, such that following formation of the second bore in the timber, and while the body remains in position, a third bore in the timber can be formed through the second guide bore, the third bore

substantially the same.

12. A kit of parts for treatment of timber, comprising a drill jig as claimed in any preceding claim and a set of plastics plugs insertable in the bores in the timber, each plug being barbed on its exterior such as to resist withdrawal from a bore.

13. A kit of parts as claimed in claim 12, wherein at least some of the plugs are open such that preservative can be injected therethrough and contain a non-return valve to prevent or at least inhibit flow outwardly of a bore when subject to excess pressure from within the bore.

14. A method of treatment of timber, comprising boring freehand a first bore in the timber substantially perpendicular to its surface, providing a drill jig having a base surface for placement against the timber, a spigot projecting from the body, the axis of the spigot being at least substantially perpendicular to the base surface, and a guide bore extending through the body, the guide bore being spaced apart form the spigot and being inclined toward the axis of the spigot, positioning the body with its base surface against the timber surface and its spigot in the first bore serving to locate the jig, forming a second bore through the guide bore into the timber, the second bore intersecting the first bore within the timber and being formed using the same boring tool used to form the first bore, closing one of the bores at or adjacent the timber

The Patent Office

INVESTOR IN PEOPLE

Application No: GB 9902783.1 **Examiner:** Hal Young
Claims searched: 1-19 **Date of search:** 29 April 1999

Patents Act 1977
Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK Cl (Ed.Q): B3C

Int Cl (Ed.6): B23B(47/28 ; 49/00)

Other: Online: WPI, EPODOC, JAPIO

Documents considered to be relevant:

Category	Identity of document and relevant passage		Relevant to claims
X	GB 2176137 A	(CHANNELWOOD), see whole document.	1,14,15,17
A	GB 2130936 A	(ROBERTSON)	
A	GB 2113282 A	(ROBERTSON)	

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.